INDEX

A

Abundance in bottom sediments and hatching requirements of eggs of *Centropages hamatus* (Copepoda: Calanoida) from the Alligator Harbor region, Florida, 142
Acholades asterias, 327
Actiniaria, 73
Adaptation, 32
ALBRECHT, K. M., AND H. LAUFER, The metabolism of methyl farnesoate in *Libinia emarginata,* 67
Alciopidae, 123
ALEXOPOULOU, M., see D. Gautreau
ALEXOPOULOU, M. G., B. SAKAGUCHI, N. SPOEREL, S. NELSON, S. ZETLAN, AND M. R. GOLDSMITH, Molecular and structural analysis of sex-linked translocations of chorion genes in *Bombyx mori,* 67
Amino acid transport, 161
Amino acid uptake and metabolism by larvae of the marine worm *Urechis caupo* (Echiura), new species in axenic culture, 317
An *in vitro* bioassay for the regulation of methyl farnesoate synthesis in disaggregated mandibular organ cells from *Libinia emarginata* and the effect of serotonin, 69
Analysis of the Gr^{16} chorion mutation of the domestic silkmoth, *Bombyx mori,* 69
ANDERSEN, R. J., see J. K. Elliott
Annual pattern of feeding, growth, and sexual reproduction in *Cyanea* (Cnidaria: Scyphozoa) in the Niantic River estuary, Connecticut, 272
Annual patterns in *Cyanea,* 272
Anthocidaris, 96
Anthozoa, 73
AOKI, MASAKAZU, KOICHIRO HASHIMOTOT, AND HIROSHI WATANABE, The intrinsic origin of bioluminescence in the ascidian, *Clavelina miniata,* 57
APF, 169
ARKETT, STUART A., FU-SHIANG CHIA, JEFF I. GOLDBERG, AND RON KOSS, Identified settlement receptor cells in a nudibranch veliger respond to specific cue, 155
Ascidian, 57
ASOTRA, SATISH, see Philip V. Mladenov
Asteroid, 73, 169
ATEMA, JELLE, see Elisa B. Karnofsky
Atropine, 176
AUFDERHEIDE, K. H., see G. W. Grimes
Auricularia, 25
Autotomy, 169
Axenic, 317
AYER, W. A., see J. K. Elliott

B

Bacterial production of tetrodotoxin in four species of chaetognatha, 191
BAEK, LEIF, see Peter Suhr-Jessen
Balanus eburneus, 301
BARAD, M., T. JACK, R. CHADWICK, A. ERLEBACHER, AND W. MCGINNIS, A novel *Drosophila* homeobox gene specific to gut muscle cells, 65
BAYLEY, C. C., see R. S. Quatrano
BEAULIEU, S. M., see D. J. Fishkind and J. Henson
BEGG, D. A., see D. J. Fishkind and J. Henson
Behavior, lobster, 249
Behavioral responses of crustacean larvae to rates of salinity change, 229
Benthos, 135
BERRY, S. J., see C. Watson
Bioluminescence in ascidian, 57
Biomedical research, marine models in, 337
Bipinnaria, 25
Blastocoel, 25
Blue crab, 50
Body plan, 25
BONDER, E. M., see D. J. Fishkind and J. Henson
BOWDAN, E., AND J. G. KUNKEL, Patterns of ionic currents about the developing cockroach oocyte, 68
BRADLEY, BRIAN P., see Bruce Tepper
BRAZEAU, DANIEL A., AND HOWARD R. LASKER, The reproductive cycle and spawning in a Caribbean gorgonian, 1
BREWER, ROBERT H., The annual pattern of feeding, growth, and sexual reproduction in *Cyanea* (Cnidaria: Scyphozoa) in the Niantic River estuary, Connecticut, 272
BRICK, I., see J. LeBlanc
BRISCOE, DAVID A., see Elizabeth A. Kingsley
BURCH, J. B. E., R. SILVA, AND A. FISCHER, Evolution and coordinate regulation of the chicken vitellogenin genes, 66
BURCH, J. B. E., R. SILVA, AND A. FISHER, Tissue-specific hypersensitive sites within two coordinately regulated loci map to a conserved 91 bp sequence located more than 5 Kb away from each promoter, 66
BURKE, ROBERT D., see Philip V. Mladenov
BUSH, K. T., M. C. KOSCIUK, H. LEE, AND R. G. NAGELE, Relationship among cytoskeletal organization, fast axonal transport, and growth rate of neurites in cultures of chick embryonic dorsal root ganglia, 68
BUSH, K. T., see A. S. DeNittis and F. J. Lynch
BYRNE, MARIA, Ultrastructure of the ovary and oogenesis in the ovoviviparous ophiuroid *Ophiolepis paucispina* (Echinodermata), 79

C

Calcium binding proteins in an insect oocyte, 71
Calcium, an overview—1989, 195
CALLAHAM, D. A., see D. H. Zhang
Callinectes sapidus, 50
CAMERON, J. LANE, see Kevin J. Eckelbarger
CAREY, A., see J. H. Norris, 66
Cephalaspidea, 103
CHADWICK, R., see M. Barad
Chaetognaths with tetrodotoxin bacteria, 191
CHAFEL, M. M., see R. M. Ezzell
Characterization of a factor with oocyte maturation inducing activity in *Spisula,* 8
Characterization, 169
Chemical activation, 218
Chemical elicits *Stomphia* swimming, 73
Chemical factor, 169
Chemosensory, 155
CHIA, F.-S., see G. D. Gibson and S. A. Arkett
Chromatography, 169

Circulation, 176
Circulatory tolerance for gravity, 176
Cirripedia, 301
Cis- and trans-regulation of a chorion gene, 65
Clavelina miniata, 57
Coagulogen, 290
Collagen, 169
Competition, 147
Compound eyes, 308
Connective tissue, 169
Conspecific fusion, 282
Control of cereal embryogenesis and the regulation of gene expression by abscisic acid (ABA), 65
COOK, CLAYTON B., see Joel Elliott
Copepods, 32, 142
Coral reefs, 218
Correlation of histocompatibility reactions with fusion between conspecifics in the solitary urochordate *Styela plicata,* 282
Cortical inheritance in ciliates, membrane microdomains, and prions: models for extranucleic acid-based inheritance, 64
Cortical reaction, 111
CORUZZI, G. M., see J. W. Edwards
Coscinasterias calamaria, parasite of, 327
Crepidula fornicata, 14
CRONIN, THOMAS W., AND CHRISTINA A. KING, Spectral sensitivity of vision in the mantis shrimp, *Gonodactylus oerstedii,* determined using noninvasive optical techniques, 308
Crustacea, 229, 301, 308
Cyanea, 272
Cytoplasmic rearrangements and dorsal-ventral axis formation in *Xenopus laevis,* 68
Cytoskeleton and early development, 63

D

DANILCHIK, M. V., see J. M. Denegre
Daphnia, 147
DENITTIS, A. S., M. W. MCCONVILLE, K. T. BUSH, C. L. RECKORD, R. G. NAGELE, AND H. LEE, The role of calcium in neural tube formation, 68
DENITTIS, A. S., see F. J. Lynch
Deep sea, 257
Delayed metamorphosis, 14
DENEGRE, J. M., AND M. V. DANILCHIK, Cytoplasmic rearrangements and dorsal-ventral axis formation in *Xenopus laevis,* 68
Dermasterias, 73
Development, 14
Developmental variability (pelagic and benthic) in *Haminoea callidegenita* (Opisthobranchia: Cephalaspidea) is influenced by egg mass jelly, 103
Diapause, 142
Diel variation in prey capture behavior by the corallimorpharian *Discosoma sanctithomae:* mechanical and chemical activation of feeding, 218
Differences in temperature dependence of early development of sea urchins with different growing seasons, 96
Differentiation of proopiomelanocortin (POMC) cells during pituitary development, 66
Dimorphic sperm of abyssal echinoid, 257
Discosoma, 218
DOYLE, HELEN, The regulation of zerknullt (zen), a homeobox gene required for the dorsal-ventral pattern of *Drosophila,* 64
DUBOIS, ARTHUR B., see Christopher S. Ogilvy
DYE, F. J., Mouse tooth germ beta-glucuronidase activity *in vitro,* 68
Dynamics of alpha-actinin and myosin in developing muscle cells, 63
Dynamics of spectrin in sea urchin oogenesis and embryogenesis, 63

E

Echinodermata, 25, 79, 257
ECKELBARGER, KEVIN J., CRAIG M. YOUNG, AND J. LANE CAMERON, Ultrastructure and development of dimorphic sperm in the abyssal echinoid *Phrissocystis multispina* (Echinodermata: Echinoidea): implications for deep sea reproductive biology, 257
ECKELBARGER, KEVIN J., see Stanley A. Rice
Ecology, 272
Ectopic *Antennapedia* legs of *Drosophila melanogaster* reveal complete homology of positional information in antenna and second leg, 69
EDWARDS, J. W., AND G. M. CORUZZI, Photorespiration and light act in concert to regulate the expression of the nuclear gene for chloroplast glutamine synthetase, 66
Effect of *Hydra* on the outcome of competition between *Daphnia* and *Simocephalus,* 147
Effects of delayed metamorphosis, 14
Egg mass jelly, 103
Eggs of *Centropages hamatus,* 142
ELGIN, RANDALL H., see Elisa B. Karnofsky
ELLIOTT, J. K., D. M. ROSS, C. PATHIRANA, S. MIAO, R. J. ANDERSON, P. SINGER, W. C. M. C. KOKKE, AND W. A. AYER, Induction of swimming in *Stomphia* (Anthozoa: Actiniaria) by imbricatine, a metabolite of the asteroid *Dermasterias imbricata,* 73
ELLIOTT, JOEL, AND CLAYTON B. COOK, Diel variation in prey capture behavior by the corallimorpharian *Discosoma sanctithomae:* mechanical and chemical activation of feeding, 218
Embryo, 25
Embryogenesis, 96
Environmental and physiological effects on plant development, 65
Epidermal uptake of nutrients in an unusual turbellarian parasitic in the starfish *Coscinasteri calamaria* in Tasmanian waters, 327
Epidermis, nutrient uptake by, 327
Epithelial movement during *Rana pipiens* gastrulation, 69
ERLEBACHER, A., see M. Barad, 65
Eurytemora, 32
Evidence of a tubular system from the plasmalemma in the egg cortex, 69
Evolution and coordinate regulation of three chicken vitellogenin genes, 66
Evolution of resistance to metals, 135
Existence and functions of a gel filled primary body cavity in development of echinoderms and hemichordates, 25
Expression of *Rhizobium meliloti* nod genes induced by exudate from mutants of white sweetclover, 70
Expression of chorion-Adh promoter fusions in *Drosophila,* 70
Expression of nodule-specific genes in ineffective alfalfa nodules induced by mutant strains of *Rhizobium meliloti,* 66
Expression of villin during differentiation of mouse visceral endoderm and F9 teratocarcinoma cells, 63
Extraembryonic epithelia can promote osteogenesis in maxillary mesenchyme of the embryonic chick, 70
EYSTER, LINDA S., see Jan A. Pechenik
EZZELL, R. M., M. M. CHAFEL, AND P. T. MATSUDAIRA, Expression of villin during differentiation of mouse visceral endoderm and F9 teratocarcinoma cells, 63

F

Feeding biology of *Discosoma,* 218
FELDMAN, K. A., A novel method of tagging developmental genes in *Arabidopsis* utilizing the T-DNA of *Agrobacterium,* 65
Fertilization envelope, 111
Field observations of social behavior, shelter use, and foraging in the lobster, *Homarus americanus,* 239
Fine structural study of the cortical reaction and formation of the egg coats in a lancelet (=amphioxus), *Branchiostoma floridae* (phylum Chordata: subphylum Cephalochordata = Acrania), 111
FISCHER, A., see J. B. E. Burch
FISHER, C. J., *In vitro* culture of avian scale skin with de novo synthesis of β-keratin, 68
FISHKIND, D., see J. Henson
FISHKIND, D. J., E. M. BONDER, S. M. BEAULIEU, J. H. HENSON, AND D. A. BEGG, Dynamics of spectrin in sea urchin oogenesis and embryogenesis, 63

Foraging, 50
in lobster, 249
FORWARD, RICHARD B., JR., Behavioral responses of crustacean larvae to rates of salinity change, 229
FOX, STEPHEN H., see Christopher S. Ogilvy
FUJISAWA, HIROSUKE, Differences in temperature dependence of early development of sea urchins with different growing seasons, 96
Fusion in urochordates, 282

G

Ganglia, 155
GAUTREAU, D., M. ALEXOPOULOU, AND M. R. GOLDSMITH, Analysis of the Gr^{16} chorion mutation of the domestic silkmoth, *Bombyx mori,* 69
Gel filled primary body cavities, 25
Gelatinous plankton, 25
Genetic adaptation, 135
Genetic correlations, 32
GIBSON, GLENYS D., AND FU-SHIANG CHIA, Developmental variability (pelagic and benthic) in *Haminoea callidegentia* (Opisthobranchia: Cephalaspidea) is influenced by egg mass jelly, 103
GOLDBERG, JEFF I., see Stuart A. Arkett
GOLDENTHAL, M. J., see F. J. Lynch
GOLDSMITH, M. R., see D. Gautreau and M. G. Alexopoulou
Gorgonian, 1
GREER, K., see R. A. Kosher
GRIMES, G. W., AND K. H. AUFDERHEIDE, Cortical inheritance in ciliates, membrane microdomains, and prions: models for extranucleic acid-based inheritance, 64
GRIPPO, J., see B. Hosler
Growth factors in limb development, 67
GUDAS, L., see B. Hosler

H

HPLC, 169
Habitat use, of lobster, 239
Haminoea callidegenita, 103
HART, N. H., AND J. S. WOLENSKI, Evidence of a tubular system from the plasmalemma in the egg cortex, 69
HASHIMOTO, KOICHIRO, see Masakazu Aoki
HAYNIE, J. L., Ectopic *Antennapedia* legs of *Drosophila malanogaster* reveal complete homology of positional information in antenna and second leg, 69
HEBERT, PAUL D. N., see Steven S. Schwartz
Hemicentrotus, 96
Hemichordate, 25
Hemocytes, 290
Hemolymph, 290
HENSON, J., S. BEAULIEU, D. FISHKIND, E. BONDER, D. LEBECHE, B. KAMINER, M. TERASAKI, AND D. BEGG, Localization and developmental dynamics of a calsequestrin-containing ER in sea urchin eggs, 64
HENSON, J. H., see D. J. Fishkind
HEPLER, P. K., see D. H. Zhang
Heritability, 135
HINES, ANSON H., see Thomas G. Wolcott
HIRSCH, A. M., see J. H. Norris
Histocompatibility, 282
HOLLAND, LINDA Z., see Nicholas D. Holland
HOLLAND, NICHOLAS D., AND LINDA Z. HOLLAND, Fine structural study of the cortical reaction and formation of the egg coats in a lancelet (=amphioxus), *Branchiostoma floridae* (phylum Chordata: subphylum Cephalochordata = Acrania), 111
Homarus americanus, 239, 249
HOMOLA, E., M. LANDAU, AND H. LAUFER, An *in vitro* bioassay for the regulation of methyl farnesoate synthesis in disaggregated mandibular organ cells from *Libinia emarginata* and the effect of serotonin, 69
Horseshoe crab, 290
HOSLER, B., G. LAROSA, J. GRIPPO, AND L. GUDAS, p2-5: a gene whose expression is reduced following induction by retinoic acid by differentiation in F9 teratocarcinoma cells, 69
HUNTER, TOM, Suspension feeding in oscillating flow: the effect of colony morphology and flow regime on plankton capture by the hydroid *Obelia longissima,* 41
Hyaline layer, 111
Hydra, 147
5-hydroxytryptamine, 8
Hydrozoa, 41

I

Identified settlement receptor cells in a nudibranch veliger respond to specific cue, 155
IGDOURA, SULEIMAN, see Philip V. Mladenov
Imbricatine, 73
Immune defense, 290
Immunological phylogeny, 282
Impact of predation on competition, 147
In vitro culture of avian scale skin with *de novo* synthesis of B-keratin, 68
In vivo and *in vitro* studies on the calcium-dependent basal level expression of the rat prolactin gene, 67
Induction of swimming in *Stomphia* (Anthozoa: Actiniaria) by imbricaine, a metabolite of the asteroid *Dermasterias imbricata,* 73
Influence of delayed metamorphosis on the growth and metabolism of young *Crepidula fornicata* (Gastropoda) juveniles, 14
Instrinsic origin of bioluminescence in the ascidian, *Clavelina miniata,* The, 57
Invertebrate
larvae, 161
vision, 308
Iridoviridae, 301

J

JH-like compounds and their implications for crustacean reproduction, 67
JACK, T., see M. Barad
JAECKLE, WILLIAM B., AND DONAL T. MANAHAN, Amino acid uptake and metabolism by larvae of the marine worm *Urechis caupo* (Echiura), a new species in axenic culture, 317
JAECKLE, WILLIAM B., see Donal T. Manahan
JAKOBSEN, PER PLOUG, see Peter Suhr-Jessen
JARNOT, B., see C. Watson

K

KADAM, ARJUN L., AND S. S. KOIDE, Characterization of a factor with oocyte maturation inducing activity in *Spisula,* 8
KAFATOS, F. C., see C. P. Romano and M. J. Shea
KAMINER, B., see J. Henson
KARNOFSKY, ELISA B., JELLE ATEMA, AND RANDALL H. ELGIN, Field observations of social behavior, shelter use, and foraging behavior in the lobster, *Homarus americanus,* 239
KARNOFSKY, ELISA B., JELLE ATEMA, AND RANDALL H. ELGIN, Natural dynamics of population structure and habitat use of the lobster, *Homarus americanus,* in a shallow cove, 247
KING, CHRISTINA A., see Thomas W. Cronin
KINGSLEY, ELIZABETH A., DAVID A. BRISCOE, AND DAVID A. RAFTOS, Correlation of histocompatibility reactions with fusion between conspecifics in the solitary urochordate *Styela plicata,* 282
KLERKS, P. L., AND J. S. LEVINTON, Rapid evolution of metal resistance in a benthic oligochaete inhabiting a metal-polluted site, 135
KOGURE, KAZUHIRO, see Erik V. Thuesen
KIDE, S. S., see Arjun L. Kadam
KOKKE, W. C. M. C., see J. K. Elliott
KOSCIUK, M. C., see K. T. Bush

KOSHER, R. A., W. M. KULYK, K. GREER, AND B. J. RODGERS, Growth factors in limb development, 67
KOSS, RON, see Stuart A. Arkett
KOULISH, SASHA, see Louis Leibovitz
KULYK, W. M., see R. A. Kosher
KUNKEL, J. G., see E. Bowdan

L

LAROSA, G., see B. Hosler
Lancelet embryology, 111
LANDAU, M., see E. Homola
LANGDALE, J. A., E. MILLER, AND T. NELSON, Patterns of leaf development in C4 plants, 64
Larvae, 14, 25, 161, 317
Larval development, 155
Larval responses to salinity, 229
Larval settlement receptor cells, 155
LASKER, HOWARD R., see Daniel A. Brazeau
LAUFER, H., JH-like compounds and their implications for crustacean reproduction, 67
LAUFER, H., see E. Homola
LAUFER, H., see K. M. Albrecht
LEBLANC, J., M. YODER, AND I. BRICK, Epithelial movement during *Rana pipiens* gastrulation, 69
LEBECHE, D., see J. Henson
LEE, H., see A. S. DeNittis, F. J. Lynch, and K. T. Bush
LEIBOVITZ, LOUIS, AND SASHA KOULISH, A viral disease of the ivory barnacle, *Balanus eburneus*, Gould (Crustacea, Cirripedia), 301
LEVINTON, J. S., see P. L. Klerks
Life history traits, 32
Limnodrilus, 135
Limulus polyphemus hemolymph, 290
LITTS, J. C., see R. S. Quatrano
Lobster population structure, habitat use, 239
Lobster social behavior, 249
Localization and developmental dynamics of a calsequestrin-containing ER in sea urchin eggs, 64
LUGO, D. I., see J. E. Pintar
LYNCH, F. J., A. S. DENITTIS, W. M. MCCONVILLE, K. T. BUSH, R. G. NAGELE, M. J. GOLDENTHAL, AND H. LEE, Microfilaments of developing chick neuroepithelial cells, 70

M

MACOL, L. A., see J. H. Norris
MANAHAN, DONAL T., WILLIAM B. JAECKLE, AND SAEID D. NOURIZADEH, Ontogenic changes in the rates of amino acid transport from seawater by marine invertebrate larvae (Echinodermata, Echiura, Mollusca), 161
MANAHAN, DONAL T., see William B. Jaeckle
Mantis shrimp spectral sensitivity, 308
MARCOTTE, W. R., see R. S. Quatrano
MARCUS, NANCY H., Abundance in bottom sediments and hatching requirements of eggs of *Centropages hamatus* (Copepoda: Calanoida) from the Alligator Harbor region, Florida, 142
MARIANI, B. D., see M. J. Shea
Marine Life Resources Workshop report, 337
Marine models in biomedical research, 337
MATSUDAIRA, P. T., see R. M. Ezzell
MCCONVILLE, M. W., see A. S. DeNittis and F. J. Lynch
MCGINNIS, W., see M. Barad
Mechanisms of cardiovascular compensation for gravity in bluefish (*Pomatomus saltatrix*), 176
Metabolism of methyl farnesoate in *Libinia emarginata*, The, 67
Metals, 135
Metamorphosis, 14
MIAO, S., see J. K. Elliott
Microfilaments of developing chick neuroepithelial cells, 70
Microscopical, biochemical, and immunological studies of the immune defense system of the horseshoe crab, *Limulus polyphemus*, 290
Microtubule dynamics during anaphase, 64
MILLER, E., see J. A. Langdale
MLADENOV, PHILIP V., SULEIMAN IGDOURA, SATISH ASOTRA, AND ROBERT D. BURKE, Purification and partial characterization of an autotomy-promoting factor from the sea star *Pycnopodia helianthoides*, 169
Models, marine, 337
Molecular and structural analysis of sex-linked translocations of chorion genes in *Bombyx mori*, 67
Mollusca, 155
Morphogenesis, 25
Morphology, 79
Mouse tooth germ beta-glucuronidase activity *in vitro*, 68

N

NAGELE, R. G., see A. S. DeNittis, K. T. Bush, and F. J. Lynch
Natural dynamics of population structure and habitat use of the lobster, *Homarus americanus*, in a shallow cove, 247
NELSON, S., see M. G. Alexopoulou
NELSON, T., see J. A. Langdale
Neurotransmitter, 8
NGUYEN-HUU, M. C., see J. Zakany
NORRIS, J. H., A. M. HIRSCH, L. A. MACOL, L. J. UTRUP, AND A. CARY, Expression of nodule-specific genes in ineffective alfalfa nodules induced by mutant strains of *Rhizobium meliloti*, 66
NORRIS, J. H., see L. J. Utrup
Northeastern Regional Conference on Developmental Biology abstracts, 63–71
NOURIZADEH, SAEID D., see Donal T. Manahan
Novel *Drosophila* homeobox gene specific to gut muscle cells, A, 65
Novel method of tagging developmental genes in *Arabidopsis* utilizing the T-DNA of *Agrobacterium*, 65
Nudibranchiata, 155

O

Obelia, 41
OGILVY, CHRISTOPHER S., STEPHEN H. FOX, AND ARTHUR B. DUBOIS, Mechanisms of cardiovascular compensation for gravity in bluefish (*Pomatomus saltatrix*), 176
Olfactory, 155
Oligochaete, 135
Onchidoris bilamellata, 155
One-cell and early two-cell stage in preimplantation mouse embryo is temperature sensitive, The, 70
Ontogenic changes in the rates of amino acid transport from seawater by marine invertebrate larvae (Echinodermata, Echiura, Mollusca), 161
Oocyte maturation, 8
Oogenesis in *Ophiolepis*, 79
Ophiolepis paucispina, 79
Ophiuroid ovary structure and oogenesis, 79
Opisthobranchia, 103
Oscillating flow, 41

P

p2-5: A gene whose expression is reduced following induction by retinoic acid of differentiation in F9 teratocarcinoma cells, 69
Parthenogenesis, 1
PATEL, M., see J. Zakany
PATHIRANA, C., see J. K. Elliott
Patterning events controlled by homeobox genes, 64
Patterns of ionic currents about the developing cockroach oocyte, 68
Patterns of leaf development in C4 plants, 65
PECHENIK, JAN A., AND LINDA S. EYSTER, Influence of delayed metamorphosis on the growth and metabolism of young *Crepidula fornicata* (Gastropoda) juveniles, 14

Peptide, 169
Phentolamine, 176
Photorespiration and light act in concert to regulate the expression of the nuclear gene for Chloroplast glutamine synthetase, 66
Phrissocystis multispina, 257
PINTAR, J. E., D. I. LUGO, AND R. SCOTT, Differentiation of proopiomelanocortin (POMC) cells during pituitary development, 66
Plankton capture, 41
Plasmatocyte, 290
Plexuarid, 1
Pluteus, 25
Polychaeta, 123
Population structure, of lobster, 239
Predation, 147, 218
Predator recognition, 73
Predator-prey interactions, 147
PRESTON, G. M., AND B. A. WHITE, *In vivo* and *in vitro* studies on the calcium-dependent basal level expression of the rat prolactin gene, 67
Primary body cavity, 25
Protochordata, 111
Purification and partial characterization of an autotomy-promoting factor from the sea star *Pycnopodia helianthoides,* 169

Q

QUATRANO, R. S., W. R. MARCOTTE, J. C. LITTS, C. C. BAYLEY, AND S. A. SCHMITZ, Control of cereal embryogenesis and the regulation of gene expression by abscisic acid (ABA), 65

R

RAFTOS, DAVID A., see Elizabeth A. Kingsley
Rapid evolution of metal resistance in a benthic oligochaete inhabiting a metal-polluted site, 135
RECKORD, C. L., see A. S. DeNittis
Regulation of anaphase chromosome motion in *Tradescantia* stamen hair cells by Ca and Ca-related signaling agents, 64
Regulation of development by hormones and growth factors, 66
Regulation of zerknullt (zen), a homeobox gene required for the dorsal-ventral pattern of *Drosophila,* 64
Relationship among cytoskeletal organization, fast axonal transport, and growth rate of neurites in cultures of chick embryonic dorsal root ganglia, 68
Reproduction, 79
Reproductive biology, deep sea, 257
Reproductive cycle and spawning in a Caribbean gorgonian, The, 1
Resistance, 135
Resting eggs, 142
RICE, STANLEY A., AND KEVIN J. ECKELBARGER, An ultrastructural investigation of spermatogenesis in the holopelagic polychaetes *Vanadis formosa* and *Krohnia lepidota* (Polychaeta: Alciopidae), 123
RIEDER, C. L., see P. Wadsworth
RODGERS, B. J., see R. A. Kosher
Role of calcium in neural tube formation, The, 68
ROMANO, C. P., AND F. C. KAFATOS, Expression of chorion-Adh promoter fusions in *Drosophila,* 70
ROSS, D. M., see J. K. Elliott
RUPP, J., see P. Wadsworth

S

SAKAGUCHI, B., see M. G. Alexopoulou
Salinity, 229
SCHMITZ, S. A., see R. S. Quatrano
SCHWARTZ, STEVEN S., AND PAUL D. N. HEBERT, The effect of *Hydra* on the outcome of competition between *Daphnia* and *Simocephalus,* 147
SCOTT, R., see J. E. Pintar
Scyphozoa, 272
Sea star autotomy-promoting factor, 169
Sea urchins, 96
SEITZ, A. W., The one-cell and early two-cell stage in preimplantation mouse embryo is temperature sensitive, 70
Selection, 135
Serotonin in *Spisula,* 8
SHEA, M. J., B. D. MARIANI, AND F. C. KAFATOS, Cis- and trans-regulation of chorion gene, 65
SHELDEN, E., see P. Wadsworth
Shelter use, lobster, 249
SILVA, R., see J. B. E. Burch
Simocephalus, 147
SINGER, P., see J. K. Elliott
Skeleton, 25
Spatial regulation of homeobox fusions in the embryonic central nervous system of transgenic mice, 65
Spawning, 8
Specific mRNA associated with cortex of giant silkmoth, 71
Spectral sensitivity of vision in the mantis shrimp, *Gonodactylus oerstedii,* determined using noninvasive optical techniques, 308
SPEOREL, N., see M. G. Alexopoulou
Sperm of holopelagic polychaetes, 123
Sperm ultrastructure, 257
Spermatogenesis, 123, 257
Spinal cord transection, 176
Spisula, 8
Starfish, 169
  parasite of, 327
Stomatopods, 308
Stomphia, 73
STRATHMANN, RICHARD R., Existence and functions of a gel filled primary body cavity in development of echinoderms and hemichordates, 25
SUHR-JESSEN, PETER, LEIF BAEK, AND PER PLOUG JAKOBSEN, Microscopical, biochemical, and immunological studies of the immune defense system of the horseshoe crab, *Limulus polyphemus,* 290
Suspension feeding in oscillating flow: the effect of colony morphology and flow regime on plankton capture by the hydroid *Obelia longissima,* 41
Symphathectomy, 1765

T

Telemetry of blue crab foraging, 50
Temperature and early development, 96
Temporal changes in a natural population of copepods, 32
Tensile strength, 169
TEPPER, BRUCE, AND BRIAN P. BRADLEY, Temporal changes in a natural population of copepods, 32
TERASAKI, M., see J. Henson
Tetrodotoxin, 191
THUESEN, ERIK V., AND KAZUHIRO KOGURE, Bacterial production of tetrodotoxin in four species of Chaetognatha, 191
Tissue-specific hypersensitive sites within two coordinately regulated loci map to a conserved 91 bp sequence located more than 5 Kb away from each promoter, 66
Tornaria, 25
Transport, 317
TUGGLE, C. K., see J. Zakany
Tunicate, 57
Turbellaria, parasitic, 327
TYLER, M. S., Extraembryonic epithelia can promote osteogenesis in maxillary mesenchyme of the embryonic chick, 70

U

Ultrasonic biotelemetry of muscle activity from free-ranging marine animals: a new method for studying foraging by blue crabs (*Callinectes sapidus*), 50
Ultrastructural investigation of spermatogenesis in the holopelagic

polychaetes *Vanadis formosa* and *Krohnia lepidota* (Polychaeta: Alciopidae), 123
Ultrastructure and development of dimorphic sperm in the abyssal echinoid *Phrissocystis multispina* (Echinodermata: Echinoidea): implications for deep sea reproductive biology, 257
Ultrastructure of the ovary and oogenesis in the ovoviviparous ophiuroid *Ophiolepis paucispina* (Echinodermata), 79
Uptake by axenic *U. caupo* larvae, 317
Urechis caupo, 317
Urochordata, 282
UTRUP, L. J., AND J. H. NORRIS, Expression of *Rhizobium meliloti* nod genes induced by exudate from mutants of white sweetclover, 70
UTRUP, L. J., see J. H. Norris

V

Vasoconstriction, 176
Venom, 191
Vibrio alginolyticus, 191
Viral disease of the ivory barnacle, *Balanus eburneus,* Gould (Crustacea, Cirripedia), A, 301
Vision, invertebrate, 308
Vitelline layer, 111

W

WADSWORTH, P., E. SHELDEN, J. RUPP, AND C. L. RIEDER, Microtubule dynamics during anaphase, 64
WANG, Y.-L., Dynamics of alpha-actinin and myosin in developing muscle cells, 63
WATANABE, HIROSHI, see Masakazu Aoki
WATSON, C., B. JARNOT, AND S. J. BERRY, Specific mRNA associated with cortex of giant silkmoth, 71
WHITE, B. A., see G. M. Preston
WIERCINSKI, FLOYD J., Calcium, an overview—1989, 195
WOLCOTT, THOMAS G., AND ANSON H. HINES, Ultrasonic biotelemetry of muscle activity from free-ranging marine animals: A new method for studying foraging by blue crabs (*Callinectes sapidus*), 50
WOLENSKI, J. S., see N. H. Hart

Y

YODER, M., see J. LeBlanc
YOUNG, CRAIG M., see Kevin J. Eckelbarger

Z

ZAKANY, J., C. K. TUGGLE, M. PATEL, AND M. C. NGUYEN-HUU, Spatial regulation of homeobox fusions in the embryonic central nervous system of transgenic mice, 65
ZETLAN, S., see M. G. Alexopoulou
ZHANG, D. H., D. A. CALLAHAM, AND P. K. HEPLER, Regulation of anaphas chromosome motion in *Tradescantia* stamen hair cells by Ca and Ca-related signaling agents, 64
ZHANG, Y., AND J. G. KUNKEL, Calcium binding proteins in an insect oocyte, 71
Zooplankton, 218